KODIAK
BIONEST
Wastewater Treatment Solutions™

Outland Camp /Nunavut

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BIONEST KODIAK

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1. INTRODUCTION

Bionest Kodiak is proud to have the opportunity to present a proposal for the wastewater treatment of your project in Baker Lake , Nunavut

Bionest Kodiak is a company whose market focus represents a reliable and simple solution for distant and/or isolated construction sites, while respecting the environment. KODIAK units are turnkey wastewater treatment plants (WWTP) which can easily be moved from one site to another, leaving virtually no ecological footprint. We consider this approach in wastewater treatment systems to be an investment proposal as opposed to an expense scenario such as the traditional method of building lagoons or using pumper trucks. As such, you are acquiring an excellent asset and value to your company.

The modular KODIAK unit allows a stepwise installation that will fully suit your treatment needs. Units can be added or removed as required while effluent quality always meets discharge requirements.

Each KODIAK unit or each group includes a BIONEST™ attached growth wastewater treatment system. Metcalfe & Eddy (2003), the most used reference in wastewater treatment, recognizes the following advantages to attach growth processes over the suspended biomass process: lower energy requirements, simpler operation, no bulking problems, less maintenance and better recovery from shock loads.

In summary, the treatment chain proposed in this document will present the following advantages:

- ✓ Consistent effluent quality;
- ✓ Modular mobile units that can easily be added or removed to fit treatment needs;
- ✓ Turnkey WWTP with ease of -installation and operation;
- ✓ Virtually no ecological impact and minor work for site reconditioning;
- ✓ Your best investment!

2. BIONEST™ TECHNOLOGIES BIONEST™ SYSTEM

The BIONEST™ system is an advanced generation of onsite wastewater treatment systems. It combines all the advantages of a durable yet simple natural system, as well as the peace of mind provided by a durable unit that will provide service for a long time. The biological process is a submerged fixed film reactor. The biomass develops and firmly attaches itself to both sides of the «ribbon shaped» plastic media (see figure 1). It provides a huge surface area for bacterial growth providing the reactor with an outstanding performance and resistance to hydraulic shocking. By comparison other systems using an organic media (peat moss or other filtering media) require frequent expensive replacements, the BIONEST™ media will never have to be replaced.

Figure 1: BIONEST ™ media offering a support for microorganisms

Constant aeration of the first 2/3 of the reactor with warm air from the mechanical room assures constant and optimal biological activity, independently of the outdoor weather conditions. Linear air diffusers (figure 3) connected to a series of diaphragm air pumps (figure 2) are used for aeration. This type of pump is powerful, quiet, economic and low cost maintenance.

Figure 1 : Diaphragm air pump

Figure 2 : Linear air diffuser

The major advantages of the BIONEST™ system are:

- ✓ High treatment level;
- ✓ Clear and odourless effluent;
- ✓ Organic and hydraulic shock resistant;
- ✓ Small footprint;
- ✓ **Media does not require replacement;**
- ✓ Reliable and long-lasting components, with built in redundancy for continuous operation;
- ✓ **Low operation and maintenance costs.**

2.1 KODIAK unit

KODIAK units are ready-to-use BIONEST™ advanced secondary wastewater treatment solution units, which can easily be moved from one location to another. All treatment components are prepared and assembled at our production plant to ensure optimum quality, quick and simple onsite installation with long durability and low maintenance. Once units are in place and inlet/outlet pipes are connected, tanks can be filled with clean water and treatment may begin.

KODIAK units represent the best investment for your company and the environment!

The following pages will present the capabilities of the KODIAK unit and how simple its installation is.

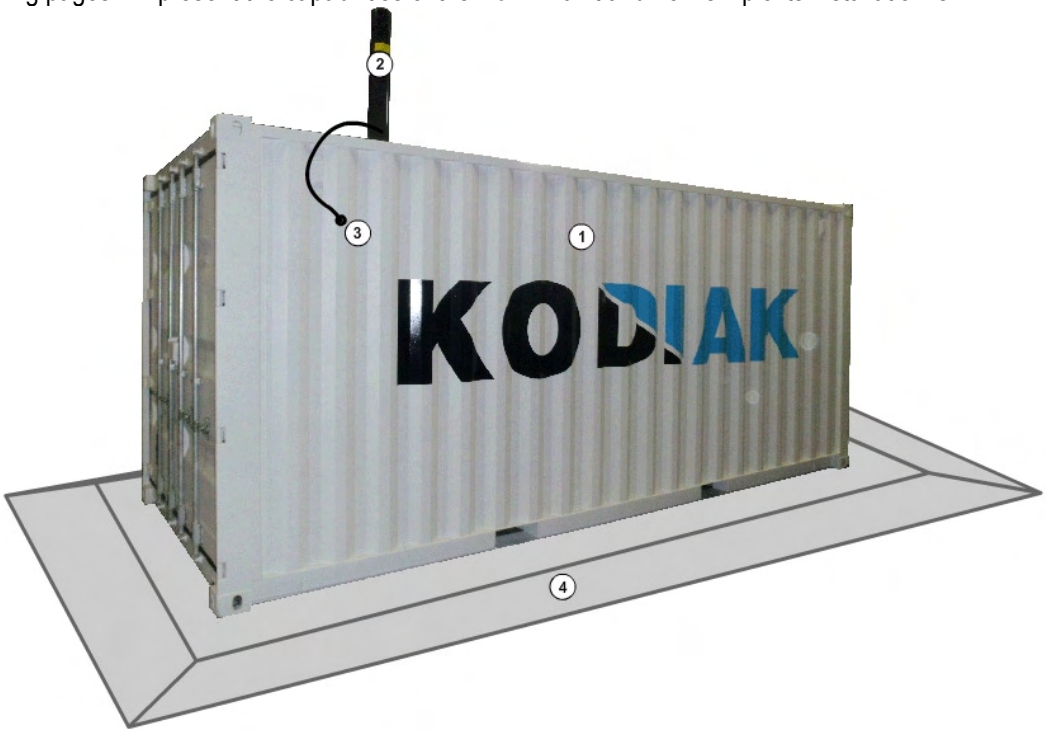

Figure 3 : KODIAK unit

1. 40 feet KODIAK unit.

2. Arctic Vent AV120-CS by heat line. 75 W; 60 Hz and 120 V.

3. Shall be connected onsite to the ground fault circuit within the unit by the Contractor. Connectors and wires are supplied by Bionest Kodiak.

4. Adequate stable bed for the unit shall be prepared. The 20 and 40 foot KODIAK units, once filled, shall weight respectively no more than 25 and 50 metric tons. Bed must be built with precise construction methods in order to avoid displacement of the container throughout the entire usage period of the KODIAK unit. Material and labour for base preparation shall be the responsibility of the Contractor.

Figure 4 : KODIAK unit's mechanical room

1. Air pumps connected to linear diffusers within the BIONEST™ reactor. One (1) spare pump supplied and spare parts for the pumps. (120 V; 60 Hz; 200 to 400 W according to model). Supplied by Bionest Kodiak.

2. Trojan UV max ultraviolet disinfection unit model "F" with upstream and downstream sampling points. 120 V; 60 Hz; 120 W. Supplied by Bionest Kodiak. (OPTION)

3. Trojan UV max control and alarms. Supplied by Bionest Kodiak.

4. Pipe insert heaters with proportional control panel and thermostat. Supplied by Bionest Kodiak.

5. BIOLARM™ alarm system for air pumps' low pressure switches, recirculation pump undercurrent relay (for the pumps recirculating within the BIONEST™ reactor) and high water level in the septic tank (effluent filter clogging). Supplied by Bionest Kodiak.

6. Recirculation line and flow rate adjustment valves. Supplied by Bionest Kodiak.

7. Light bulb. Supplied by Bionest Kodiak.

8. Air vent for ultraviolet disinfection unit. Supplied by Bionest Kodiak.

9. "Dragon" thermostat controlled air heater. Supplied by Bionest Kodiak.

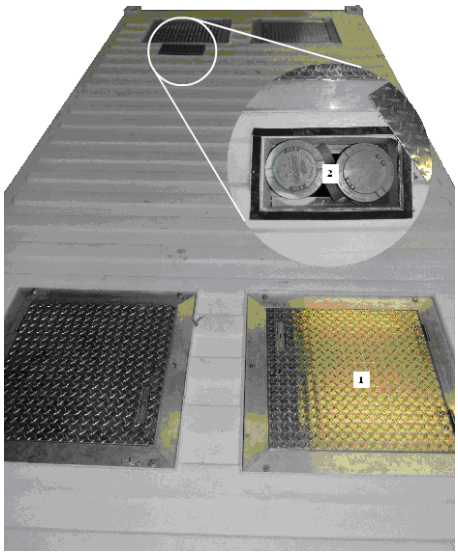

Figure 5 : Access opening and pipe insert heaters

1. Access covers (610 mm x 610 mm [24" x 24"]). Supplied by Bionest Kodiak.

2. Two (2) ASB 9 000 W pipe insert heaters controlled by a proportional Ranco thermostat and intelligent relays. Supplied by Bionest Kodiak.

3. TREATMENT PERFORMANCES

The hereby proposed treatment system is designed to meet the treatment performances indicated at Table 1. The BIONEST™ system has been tested by independent testing organizations and has obtained;

- NSF Mark as a Class 1 system under the provisions of NSF/ANSI Standard 40,
- BNQ Certification as Class III and V (with disinfection) systems,
- CE Mark after testing was completed at the CSTB facilities in Nantes, France.

The BIONEST™ system has recently received its ETV Canada Verified Technology Mark and has successfully completed the NSF standard 245 certification which includes standards 40 and requires a reduction of 50% of total nitrogen (TN). Results of ETV Canada's verification are available at www.etvcanada.ca, while detailed results of the BNQ testing are attached to the present.

Table 1 : Treatment performances - BIONEST™ treatment unit with ultraviolet disinfection

Parameters	Concentrations
$CBOD_{5,C}$[1]	10 mg/L
TSS[2]	10 mg/L
Fecal coliforms	200 CFU[3]/100 ml (after reactivation)
Azote ammoniacal NH4-N	< 10 mg/L

[1] Carbonaceous biochemical oxygen demand (5 days)

[2] Total suspended solids

[3] Colony forming units

4. DESIGN CRITERIA

Sewage will require treatment based on flow rate of 250 liters /day/worker

64 X 250 liters/person = 16,ooo liters/day

Kodiak 40 Treat 13,500 l/d -
Kodiak 20 Treat 5,500 l/d -

5. KODIAK UNIT

[redacted]

6. SALE PRICE

ÉQUIPMENT	UNIT COST	TOTAL
KODIAK UNIT 40 '	105 000 $	105 000 $
KODIAK UNIT 20 '	70 000 $	70 000 $
UV Disinfection	5 000 $	5 000 $
Mat and Strobe Light	500 $	500 $
Heated Roof Vent	included	Included
Insert Pipe Heater	Included	Included
Technical assistance for installation & start-up	3 500 $	3 500 $
(Transport and lodging not included_		
Transport to Bécancour	700 $	1 400 $

7. EXCLUSIONS WITH EACH UNIT

Materials and services indicated below are not included in this quote:

- Taxes;
- Obtaining the necessary permits and certificates of authorization ;
- Any tank and/or pump station not in the above supplies;
- Fittings and electrical supplies aside from the KODIAK unit;
- Gravity and/or forcemain pipes and fittings and their insulation;
- Unloading and installation of tanks and/or other equipments;
- Clean water filling of all tanks for start-up;
- Installation supervision by Bionest Kodiak certified technicians;
- Start-up by Bionest Kodiak certified technicians;
- Pad (bed) preparation and material for containers and other equipments;
- Cleaning, reconditioning and delivery of any returned material;
- Construction of an outfall or soil absorption system (SAS) construction, connection or material supply;
- Any services and/or subcontractors hired by the client;
- Anything not listed in this quotation.

8. INCLUDED WITH EACH UNIT

- Operation's manual;
- Technical assistance
- Two (2) year warranty of all components of the BIONEST™ KODIAK system and twenty (20) year warranty on the BIONEST™ media.